What is claimed is:

1 1.   A system comprising:
2   a first module adapted to receive a set of queries and to provide a set of candidate
3 indexes for the set of queries, the first module adapted to eliminate one or more candidate
4 indexes based on one or more predetermined criteria; and
5   an optimizer adapted to generate a recommended index from the set of candidate
6 indexes.

1 2.   The system of claim 1, wherein the set of queries comprises a set of SQL
2 statements.

1 3.   The system of claim 1, wherein the optimizer is adapted to generate at least
2 another recommended index from the set of candidate indexes.

1 4.   The system of claim 1, wherein the optimizer is adapted to use statistics.

1 5.   The system of claim 4, wherein the statistics are based on a scan of a sample of
2 one or more tables, the sample less than all the rows of the one or more tables.

1 6.   The system of claim 5, further comprising a user interface to receive an indication
2 of a user-specified size of the sample.

1 7.   The system of claim 1, wherein the one or more predetermined criteria comprises
2 a threshold change rate, the first module adapted to eliminate one or more candidate
3 indexes having a change rate exceeding the threshold change rate.

1 8.   The system of claim 7, wherein the first module is adapted to further eliminate a
2 candidate index that is a subset of another candidate index.

49

1   9.   The system of claim 1, further comprising an analysis module adapted to apply a
2   genetic algorithm, the analysis module adapted to cooperate with the optimizer to
3   generate the recommended index.

1   10.   The system of claim 9, wherein the first module is adapted to provide the set of
2   candidate indexes by identifying the candidate indexes from the set of queries and
3   defining the set of queries in a database.

1   11.   The system of claim 10, wherein the analysis module is adapted to access the
2   database to retrieve the candidate indexes.

1   12.   The system of claim 10, further comprising a validation module adapted to
2   validate the recommended index in a database system.

1   13.   The system of claim 12, further comprising a user interface to receive user-
2   specified one or more indexes, the optimizer adapted to generate a cost associated with a
3   query plan based on the user-specified one or more indexes.

1   14.   The system of claim 13, wherein the user interface is adapted to receive a user-
2   specified percentage value, the system further comprising another module to collect
3   statistics based on a sample of rows of one or more tables, a size of the sample based on
4   the user-specified percentage value.

1   15.   The system of claim 14, further comprising another module adapted to provide a
2   hint on which table or tables statistics need to be collected.

1   16.   The system of claim 10, wherein the analysis module is adapted to access the
2   database to retrieve the candidate indexes.

1 17.   The system of claim 1, further comprising an analysis module adapted to apply a

2 predetermined algorithm, the analysis module adapted to cooperate with the optimizer to

3 generate the recommended index.

1 18.   The system of claim 17, wherein the analysis module is adapted to submit

2 candidate indexes to the optimizer, the optimizer adapted to determine the cost of one or

3 more of the queries based on the candidate indexes.

1 19.   The system of claim 18, wherein the optimizer is adapted to select the candidate

2 index associated with a lowest cost as the recommended index.

1 20.   The system of claim 1, wherein the set of queries comprises a workload captured

2 in a database system, and wherein the database system is a parallel system having plural

3 access modules.

1 21.   The system of claim 20, wherein the optimizer is adapted to compute costs for the

2 candidate indexes for the database system.

1 22.   A method of selecting a recommended index for a database system, comprising:

2   receiving a workload containing a set of queries of the database system;

3   generating a set of candidate indexes from the workload;

4   removing candidate indexes based on one or more predetermined criteria; and

5   invoking an optimizer to provide cost analysis to generate the recommended

6 index from the set of candidate indexes.

1 23.   The method of claim 22, further comprising applying a predetermined algorithm

2 to identify the recommended index.

1 24.   The method of claim 23, wherein applying the predetermined algorithm

2 comprises applying a genetic algorithm.

51

1   25.   The method of claim 24, further comprising selecting the candidate index having

2   a lowest cost as the recommended index.

1   26.   The method of claim 22, further comprising providing graphical user interface

2   screens to receive user input for selecting the recommended index.

1   27.   The method of claim 26, wherein providing graphical user interface screens

2   comprises displaying an activatable item to perform workload identification to identify

3   the workload.

1   28.   The method of claim 27, wherein providing the graphical user interface screens

2   further comprises displaying another activatable item to perform workload definition to

3   save the workload into a database.

1   29.   The method of claim 28, wherein providing the graphical user interface screens

2   further comprises displaying another activatable item to perform index analysis to

3   analyze the candidate indexes to generate the recommended index.

1   30.   The method of claim 29, wherein providing the graphical user interface screens

2   further comprises displaying another activatable item to validate the recommended index

3   in the database system.

1   31.   The method of claim 29, wherein providing the graphical user interface screens

2   comprises displaying another activatable item to validate the recommended index in a test

3   system having an emulated environment of the database system

1   32.   The method of claim 30, wherein providing the graphical user interface screens

2   further comprises displaying another activatable item to cause submission of a command

3   to the database system to create the recommended index.

1   33.   The method of claim 26, wherein providing the graphical user interface screens

2   comprises displaying one or more reports relating to the recommended index.

1   34.   The method of claim 33, wherein providing the graphical user interface screens

2   further comprises displaying a comparison of a cost using the recommended index with a

3   cost using an existing index.

1   35.   The method of claim 33, wherein providing the graphical user interface screens

2   further comprises displaying cost improvement relating to use of the recommended index.

1   36.   The method of claim 22, wherein invoking the optimizer is performed in a test

2   system separate from the database system.

1   37.   The method of claim 36, further comprising importing environment information

2   of the database system into the test system to emulate the database system in the test

3   system.

1   38.   The method of claim 37, wherein importing the environment information

2   comprises importing the environment information of a parallel database system having

3   plural access modules.

1   39.   The method of claim 22, wherein invoking the optimizer is performed in the

2   database system.

1   40.   An article comprising at least one storage medium containing instructions that

2   when executed cause a system to:

3   receive a set of queries;

4   generate a set of candidate indexes from the set of queries;

5   eliminate candidate indexes based on one or more predetermined criteria;

6   invoke an optimizer to perform cost analysis of the candidate indexes; and

7   use the cost analysis to select a recommended index for a database system.

1   41.   The article of claim 40, wherein the instructions when executed cause the system

2   to eliminate a candidate index that has a change rate greater than a preset threshold.

1   42.   The article of claim 41, wherein the instructions when executed cause the system

2   to eliminate a candidate index that is a subset of another candidate index.

1   43.   The article of claim 40, wherein the instructions when executed cause the system

2   to apply a genetic algorithm to select the recommended index.